

**WHAT IS CLAIMED IS:**

1. A method of making glass, the method comprising:

processing a molten glass batch including Se in order to form a resulting glass product comprising  $\text{SiO}_2$  and Se, in a manner so that the resulting glass product retains at least 30% of the Se originally present prior to melting.

2. The method of claim 1, wherein said processing is performed so that the resulting glass product retains at least 40% of the Se originally present prior to melting.

3. The method of claim 1, wherein said processing is performed so that the resulting glass product retains at least 50% of the Se originally present in the batch prior to melting.

4. The method of claim 1, further comprising adding Epsom salt to the batch in an amount sufficient to reduce Se burnoff during melting or the processing.

5. The method of claim 4, wherein the Epsom salt comprises  $\text{MgSO}_4 \times 7\text{H}_2\text{O}$ .

6. The method of claim 4, further comprising adding the Epsom salt to the batch in an amount of from 0.1 to 2.0% by weight.

7. The method of claim 1, wherein said processing is performed so that the resulting glass product comprises a base glass portion comprising:

<u>Ingredient</u>	<u>wt. %</u>
SiO <sub>2</sub>	67 – 75 %
Na <sub>2</sub> O	10 – 20 %
CaO	5 – 15 %
MgO	0 – 5 %
Al <sub>2</sub> O <sub>3</sub>	0 – 5 %
K <sub>2</sub> O	0 – 5 %
BaO	0 – 1 %

and a colorant portion comprising:

<u>Ingredient</u>	<u>Amount</u>
Total iron (expressed as Fe <sub>2</sub> O <sub>3</sub> ):	1.0 to 2.2 % (wt. %)
selenium (Se):	10 to 50 ppm
cobalt oxide:	0.015 to 0.040 %
titanium oxide:	0 to 3.5 %
chromium oxide:	0 to 80 ppm.

8. The method of claim 7, wherein the glass is grey in color and has a dominant wavelength in the range of from 435 nm to 570 nm.

9. The method of claim 7, further comprising adding from 30-90 ppm of Se metallic powder to the batch.

10. The method of claim 7, further comprising adding from 70 to 180 ppm of  $\text{Na}_2\text{SeO}_3$  to the batch, so that at least a portion of the Se is added to the batch in the form of  $\text{Na}_2\text{SeO}_3$ .

11. The method of claim 7, wherein said processing is performed so that the resulting glass product includes a colorant portion comprising:

<u>Ingredient</u>	<u>Amount</u>
Total iron (expressed as $\text{Fe}_2\text{O}_3$ ):	1.2 to 1.8 % (wt. %)
selenium (Se):	20 to 40 ppm
cobalt oxide:	0.018 to 0.030 %
titanium oxide:	0.1 to 2.6 %
chromium oxide:	5-20 ppm.

12. The method of claim 1, wherein said processing is performed so that the resulting glass product includes a base glass portion comprising:

<u>Ingredient</u>	<u>wt. %</u>
$\text{SiO}_2$	67 – 75 %
$\text{Na}_2\text{O}$	10 – 20 %
$\text{CaO}$	5 – 15 %
$\text{MgO}$	0 – 5 %
$\text{Al}_2\text{O}_3$	0 – 5 %
$\text{K}_2\text{O}$	0 – 5 %
$\text{BaO}$	0 – 1 %

and a colorant portion consisting essentially of:

<u>Ingredient</u>	<u>Amount</u>
Total iron (expressed as $\text{Fe}_2\text{O}_3$ ):	1.0 to 2.2 % (wt. %)
selenium (Se):	10 to 50 ppm
5 cobalt oxide:	0.015 to 0.040 %
titanium oxide:	0 to 3.5 %
chromium oxide:	0 to 80 ppm.

13. A method of making glass, the method comprising:

10 providing a glass batch including  $\text{SiO}_2$ ,  $\text{Fe}_2\text{O}_3$ , Epsom salt, and an original amount of Se; and

forming a resulting glass product from the glass batch in a manner such that the resulting glass product includes at least 30% of the original amount of Se due at least to the presence of a sufficient quantity of the Epsom salt in the batch.

15 14. The method of claim 13, further comprising forming the resulting glass product in a manner such that the resulting glass product includes at least 40% of the original amount of Se.

15. The method of claim 14, further comprising forming the resulting glass product in a manner such that the resulting glass product includes at least 50% of the  
20 original amount of Se.

16. The method of claim 13, wherein the glass batch includes from 30-90 ppm Se and from 0.1 to 2.0% Epsom salt.

17. The method of claim 16, wherein the resulting glass product includes from  
5 10-50 ppm Se.

18. The method of claim 13, wherein the Epsom salt comprises  $\text{MgSO}_4 \times 7\text{H}_2\text{O}$ .

19. The method of claim 13, wherein said forming is performed so that the  
10 resulting glass product comprises a base glass portion comprising:

Ingredient	wt. %
$\text{SiO}_2$	67 – 75 %
$\text{Na}_2\text{O}$	10 – 20 %
$\text{CaO}$	5 – 15 %
15 $\text{MgO}$	0 – 5 %
$\text{Al}_2\text{O}_3$	0 – 5 %
$\text{K}_2\text{O}$	0 – 5 %
$\text{BaO}$	0 – 1 %

and a colorant portion comprising:

<u>Ingredient</u>	<u>Amount</u>
Total iron (expressed as $\text{Fe}_2\text{O}_3$ ):	1.0 to 2.2 % (wt. %)
selenium (Se):	10 to 50 ppm
cobalt oxide:	0.015 to 0.040 %
5 titanium oxide:	0 to 3.5 %
chromium oxide:	0 to 80 ppm
copper oxide:	0 to 500 ppm.

20. The method of claim 19, wherein the resulting glass product is  
 10 substantially free of nickel (Ni) and manganese (Mn).

21. The method of claim 13, wherein the resulting glass product includes from  
 1.0 to 2.2 % total iron (expressed as  $\text{Fe}_2\text{O}_3$ ), and has a redox value  $\text{FeO}/\text{Fe}_2\text{O}_3$  of from  
 0.20 to 0.30.

22. The method of claim 13, wherein the resulting glass product has an Lta  
 15 (visible transmission, Ill. A, 2 degree observer) of from 10-30 %, and an IR  
 transmission percentage (%) of from 3-28%.

23. The method of claim 22, wherein the resulting glass product has a  
 transmissive  $a^*$  value (Ill. D65, 10 degree observer) of from 0.0 to -10.0, and a  
 transmissive  $b^*$  value (Ill. D65, 10 degree observer) of from -4.0 to +10.0.

24. A method of making a grey colored glass, the method comprising:  
 providing a molten glass batch comprising  $\text{SiO}_2$ , Se, and Epsom salt;  
 processing the glass batch in order to make a resulting grey colored glass  
 product, the grey colored glass product including a base glass portion comprising:

5	<u>Ingredient</u>	<u>wt. %</u>
	$\text{SiO}_2$	67 – 75 %
	$\text{Na}_2\text{O}$	10 – 20 %
	$\text{CaO}$	5 – 15 %
	$\text{MgO}$	0 – 5 %
10	$\text{Al}_2\text{O}_3$	0 – 5 %
	$\text{K}_2\text{O}$	0 – 5 %
	$\text{BaO}$	0 – 1 %

and a colorant portion comprising:

	<u>Ingredient</u>	<u>Amount</u>
15	Total iron (expressed as $\text{Fe}_2\text{O}_3$ ):	1.0 to 2.2 % (wt. %)
	selenium (Se):	10 to 50 ppm
	cobalt oxide:	0.015 to 0.040 %
	titanium oxide:	0 to 3.5 %
	chromium oxide:	0 to 80 ppm;

20 and wherein the Epsom salt is provided in the glass batch in sufficient quantity  
 so that the resulting glass product retains at least 30% of the Se originally present in the  
 batch.

25. The method of claim 24, wherein the Epsom salt is provided in the glass batch in sufficient quantity so that the resulting glass product retains at least 40% of the Se originally present in the batch.

26. The method of claim 25, wherein the Epsom salt is provided in the glass batch in an amount of from 0.1 to 2.0% by weight so that the resulting glass product retains at least 50% of the Se originally present in the batch.

27. A grey colored glass comprising:  
a base portion and a colorant portion;  
said base portion of the glass comprising:

	<u>Ingredient</u>	<u>wt. %</u>
10	SiO <sub>2</sub>	67 – 75 %
	Na <sub>2</sub> O	10 – 20 %
	CaO	5 – 15 %
	MgO	0 – 5 %
15	Al <sub>2</sub> O <sub>3</sub>	0 – 5 %
	K <sub>2</sub> O	0 – 5 %
	BaO	0 – 1 %

and said colorant portion consisting essentially of:



<u>Ingredient</u>	<u>Amount</u>
Total iron (expressed as $\text{Fe}_2\text{O}_3$ ):	1.2 to 1.8 % (wt. %)
selenium (Se):	10 to 50 ppm
cobalt oxide:	0.015 to 0.040 %
5 titanium oxide:	0.2 to 3.5 %
chromium oxide:	5-20 ppm; and

wherein the glass is grey in color and has a dominant wavelength in the range of from 435 nm to 570 nm, is substantially free of manganese dioxide, and is substantially free of nickel.

10 28. The glass of claim 27, wherein the glass has an excitation purity (Pe) from 1 to 7%.

29. The glass of claim 27, wherein the glass has a visible transmission Lta (Ill. A, 2 degree observer) of from 10-30 %, and an IR transmission of from 3-28%.

15 30. The glass of claim 29, wherein the glass has a transmissive  $a^*$  value (Ill. D65, 10 degree observer) of from 0.0 to -10.0, and a transmissive  $b^*$  value (Ill. D65, 10 degree observer) of from -4.0 to +10.0.

31. A glass comprising:

<u>Ingredient</u>	<u>wt. %</u>
SiO <sub>2</sub>	67 – 75 %
Na <sub>2</sub> O	10 – 20 %
CaO	5 – 15 %
MgO	0 – 5 %
Al <sub>2</sub> O <sub>3</sub>	0 – 5 %
K <sub>2</sub> O	0 – 5 %
BaO	0 - 1%; and

wherein the glass has a Se retention of at least 30%.